

Name: _____ Date: _____ Class: _____

Pod Racer

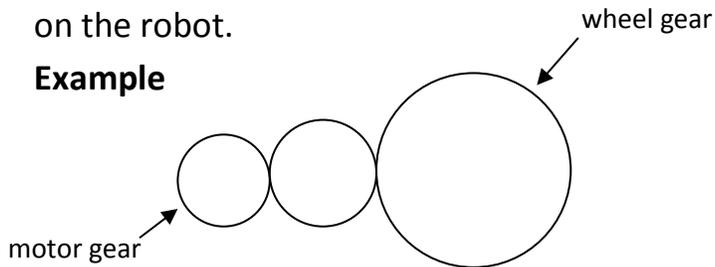
Activity Workbook

Experiment #1

Using the “gearing up” pod racer

1. Use the space below to draw, to the best of your ability, the arrangement of the gears on the robot.

Example



2. On your drawing, **identify** the gear directly connected to the motor. Draw an arrow to the gear and label “**motor gear.**”
3. On your drawing, **identify** the gear directly connected to the wheel. Draw an arrow to the gear and label “**wheel gear.**”
4. With your groups, carry out the following experiments.
 - a. Turn ON your pod racer, and pick the following:
My Files → Software files → pod_racer → Run
 - b. GENTLY PLACE the racer on the floor by the starting line. Make sure the touch sensor is touching the floor.
 - c. DECIDE on the start and finish lines for your race.
2-3 members of your group should be at the start line.
2-3 members of your group should be at the finish line, ready to lift the robot off the ground when it crosses.
 - d. When you are ready to race, PRESS the ORANGE ENTER button
 - e. LIFT the racer off the ground **immediately** after crossing the finish line.
 - f. RECORD your *distance*, *time*, and *speed* results in the table below.

Results Table #1

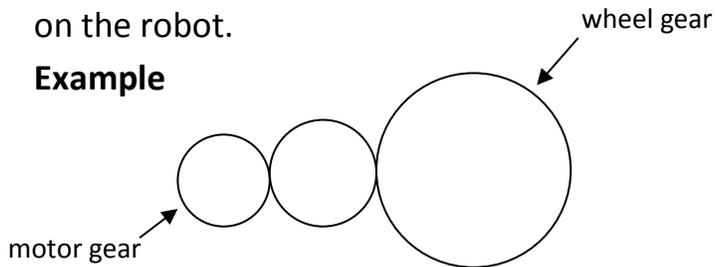
Test #	Distance Traveled (in inches)	Time Traveled (in seconds)	Average Speed (in inches per second)
1			
2			
3			
4			
5			
6			
7			
8			

Experiment #2

Using the “gearing down” pod racer

1. Use the space below to draw, to the best of your ability, the arrangement of the gears on the robot.

Example



2. On your drawing, **identify** the gear directly connected to the motor. Draw an arrow to the gear and label “**motor gear.**”
3. On your drawing, **identify** the gear directly connected to the wheel. Draw an arrow to the gear and label “**wheel gear.**”
4. With your groups, carry out the following experiments.
 - a. Turn ON your pod racer, and pick the following:
My Files → Software files → pod_racer → Run
 - b. GENTLY PLACE the racer on the floor by the starting line. Make sure the touch sensor is touching the floor.
 - c. DECIDE on the start and finish lines for your race.
2-3 members of your group should be at the start line.
2-3 members of your group should be at the finish line, ready to lift the robot off the group when it crosses.
 - d. When you are ready to race, PRESS the ORANGE ENTER button
 - e. LIFT the racer off the ground **immediately** after crossing the finish line.
 - f. RECORD your *distance*, *time*, and *speed* results in the table below.

Results Table #2

Test #	Distance Traveled (in inches)	Time Traveled (in seconds)	Average Speed (in inches per second)
1			
2			
3			
4			
5			
6			
7			
8			

Experiment #3

Using BOTH racers

1. ADD the same amount of weight to each of the racers.
2. RUN the **pod_racer** program again.
3. RECORD your observations below. Is one racer able to travel with weight added? Is one racer **NOT** able to travel with weight added?
4. Continue to add weight to both racers until one is unable to move forward. *Which robot is capable of moving with more weight?*

Observations:

Conclusions/Reflections

1. Which racer – “gearing up” or “gearing down” – went faster?
2. What made the racers perform at different speeds?
3. What was the **approximate difference** in speeds between the two pod racers? **SHOW** your work.
4. Write **2** ways to make the “gearing up” racer go **FASTER**.